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An Evaluation of Aquablast's Wyman Valves

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16. ABSTRACT

Representatives from Aquablast Inc. of Scarborough, Ontario, Canada, contacted the Emission Control Technology Division inquiring about the possible testing by EPA of vehicles with their Wyman valves installed. Data was supplied showing significant reductions of carbon monoxide on vehicles with the valves installed. ECTD agreed to test their product on two vehicles.

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July 1973

Emission Control Technology Division
Office of Air and Water Programs
Environmental Protection Agency

Background

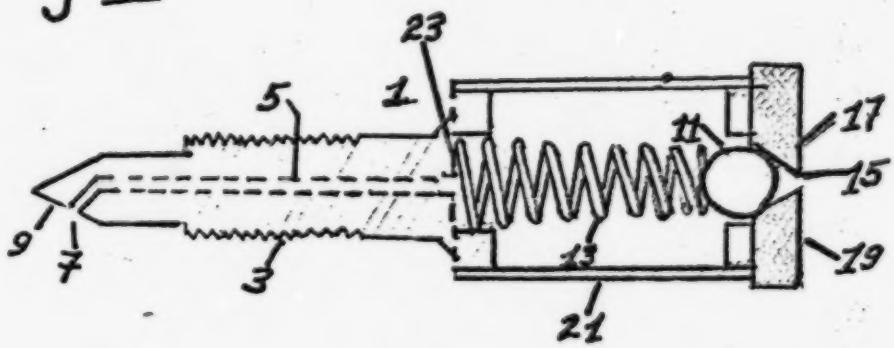
Representatives from Aquablast Inc. of Scarborough, Ontario, Canada, contacted the Emission Control Technology Division inquiring about the possible testing by EPA of vehicles with their Wyman valves installed. Data was supplied showing significant reductions of carbon monoxide on vehicles with the valves installed. ECTD agreed to test their product on two vehicles.

Device Tested

The Wyman needles, developed by Mr. Curt R. Wyman of Germany, replace the standard idle mixture adjusting screws of a carburetor in a 4-cycle internal combustion engine. Each needle has a hole drilled through the middle so that air flows through at conditions of idling and coasting when the vacuum is high, but when the vacuum drops below 15" Hg, as in the case of acceleration and high speed, a coil spring inside the needle pushes a ball against a seat closing off the air stream so that a richer mixture is provided. A diagram of one of the needles is shown below:

Wyman needle

Fig. 1



Test Program

Two vehicles were used in the test program; a 1963 Ford Galaxie 289 CID, V-8 engine, 2-V carburetor with automatic transmission tested at 4000# inertia weight, and a 1970 Chevrolet Impala 350 CID V-8, 2-V carburetor engine with automatic transmission tested at 4500# inertia weight.

Before any testing was started both vehicle engines were set to the recommended idle rpm and timing; idle CO for the Chevrolet was set at .5% and for the Ford 2%. Two emissions tests* were then performed on each vehicle in this stock configuration to be used as the baseline results.

The stock idle needles (two in each vehicles carburetor) were then replaced by Wyman needles. These needles were screwed in far enough so that idle CO was identical to the stock configuration. Idle rpm and timing were checked, but no admustments were necessary to stock specifications. The vehicles were then each tested twice with the Wyman needles installed.

Test Results

The test results are presented in the Appendix of this report. These results are summarized below. In addition to emission results, fuel economy was calculated for each test using a carbon balance technique.

Summary of Test Results
% Decrease from Baseline

1970 Chevrolet	HC	13%
	CO	19%
	NOx	4%
	MPG	0%
1963 Ford	HC	6%
	CO	29%
	NOx	-17% (increase)
	MPG	-3% (increase)

Conclusions

On the two EPA test vehicles HC and CO emissions were reduced with the Wyman valves installed while NOx emissions decreased slightly in one vehicle and increased in the other. Fuel economy was not significantly affected.

* All testing was performed according to the 1975 Federal Test Procedure (FTP) as outlined in the November 15, 1972, Federal Register for light duty vehicles.

APPENDIX

Aquablast Test Program - 1975 Federal Test Procedure

	Test No.	HC gpm	CO gpm	CO_2 gpm	NOx gpm	Fuel Economy mpg
Chevrolet	16-386	2.20	26.85	641.8	4.76	12.93
Baseline	16-391	1.95	24.88	678.0	4.68	12.44
	Average	2.08	25.86	659.9	4.72	12.68
Chevrolet	16-397	1.79	21.10	666.0	4.87	12.71
Wyman	16-400	1.81	20.96	662.7	4.20	12.77
Needles	Average	1.80	21.03	664.4	4.54	12.74
Ford	16-493	6.11	85.85	437.85	2.63	14.82
Baseline	16-495	6.23	84.31	447.35	2.95	14.74
	Average	6.17	85.08	442.60	2.79	14.78
Ford	16-507	5.67	61.34	452.7	3.12	15.53
Wyman	16-515	5.96	60.27	466.8	3.41	15.04
Needles	Average	5.82	60.80	459.8	3.26	15.28